D2.1c Comparative Cognitive Mapping Guidelines

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Introduction

Transcrisis aims to develop a solid understanding of the role of leaders in managing transboundary crises, and the requirements for ensuring an effective and legitimate crisis response. In addition to material and institutional requirements, leaders' policy ideas, peoples' preferences and public discourses play an important role in many of the seven phases of crisis management identified in this project, like for instance in the phase of detection, coordination, and especially meaning making and communication. Establishing the precise nature and effects of these 'soft' but influential factors in crisis management is notoriously difficult, for ideas, preferences and discourses are intangible phenomenon that cannot be observed directly (Fiske & Taylor 1991; Risse 1994).

To be able to study these phenomenon and their effects on the effectiveness and legitimacy of crisis management, Transcrisis will make use of a method that was specifically designed to analyse such ideational factors: the method of Comparative Cognitive Mapping (CCM). CCM is a well-developed technique that has been successfully applied in many fields of study (Axelrod, 1976; Bougon, Weick & Binkhorst 1977; Curseu, Schalk & Schruijer 2010; Princen & Van Esch forthcoming; Van Esch 2012; 2014; Young & Schafer 1998). It may provide insight in the ideas and preferences of the various leaders involved in transboundary crisis management, but has also been used to study discourses and the way citizens think about the causes of, and potential solutions to crises. Through its various modes of analysis, CCM also enables a comparison between actors' and the evolution of ideas and discourses over time. As such, CCM provides an useful technique to apply in the various case-studies within the Transcrisis project and can be combined with techniques that provide insight in the material and institutional requirements for effective and legitimate crisis management. This guideline will provide an overview of the CCM technique as well as some basic instructions of how to apply the method. In addition, it will offer the reader several illustrations of the relevance of CCM. A more detailed coding manual will be developed as part of Work Package 3 of the project.

Cognitive Mapping

In this section, an overview is provided of the method of Cognitive Mapping and how it may be used to reveal leaders' ideas, peoples' preferences and public discourses. The section ends with a brief discussion of the validity and reliability of the method.

From Idea to Graph

The Cognitive Mapping technique rests upon the premise that ideas, preferences and discourses can be derived from actors' speech-acts and represented in visual and graphical form (Axelrod 1976; Young & Schafer 1998; Clarkson & Hodgkinson 2005). The method is open in terms of the issues and actors that are studied and can be used to explore the ideas of individuals, institutions and groups on any subject, as long as these ideas are made known to the researcher through speeches, interviews, written documents, or graphical representation (Axelrod 1976). CCM thus derives ideas from actors' spoken or written communication rather than their behaviour (Axelrod 1976; Young & Schafer 1998).

In contrast to content analysis, which is essentially 'a counting procedure', the analytical basis of a cognitive map is the relationship between concepts, rather than the concepts themselves (Axelrod 1976: 7). As such, a map typically includes the subject-verb-object constructions (Young 1996: 397). More specifically, to create a cognitive map all *causal* and *utility* relationships between concepts are manually derived from a text or speech-act or directly draw by the respondent. Utility statements are statements to the effect that something is 'good', 'in someone's interest', 'in the general benefit'. Extensive coding-manuals exists to help scholars, and experience shows that relatively little training is needed to achieve good rates of inter-coder reliability (Axelrod 1976; Bonham & Shapiro 1976; Hart 1977; Wrightson 1976; Young & Schafer 1998).

In principle, the concepts included in a CM must all be unique concept, synonyms describing the same phenomenon should be grouped under a single 'standardised' concept prior to constructing a CM. Moreover, in case of comparative or longitudinal analyses additional standardization of concepts may be needed by placing idiosyncratic events and concepts under the label of a general phenomenon (Heradstveit & Narvesen 1978: 81). No rules exist for the proper level of standardization other than that it should do justice to the meaning actors assign to their ideas and it suits the ontological and theoretical focus of the study at hand (Laukanen & Wang 2015; Young 1994).[1]

Subsequently, the cognitive map is constructed by transforming the causal and utility-relations into a visual graph in which the concepts are depicted as points and the relations between these concepts as arrows (Axelrod 1976; Van Esch 2007; Young 1996; Young & Schafer 1998; see figure 1). To facilitate visualisation, cognitive mapping software Worldview and Gephi may be used (Young 1996; Bastian, Heymann, Jacomy 2009). In general, scholars should aim to position cause-concepts at the left-hand side of the map and the effect-concepts at the right-hand side to facilitate

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[1] The coding of texts or speech-acts and standardisation of concepts may be facilitated by the use of CM software MAPS. This software also automatically generates data import files suitable for other CM software programmes like Worldview and Gephi. MAPS was developed by Femke van Esch in collaboration with Btdt.btt and will be made freely available for all participants of TRANSCRISIS for the duration of the project.

analysis. The relationships (arrows) in the map are attributed a sign to indicate whether a concept is perceived to contribute positively (+) or negatively (-) to another, or whether the actor has (explicitly) indicated that a concept has no bearing on another (0). To increase the transparency of the map, scholars may choose to display more salient concepts and relations in a larger font or a thicker arrow (see figure 1).
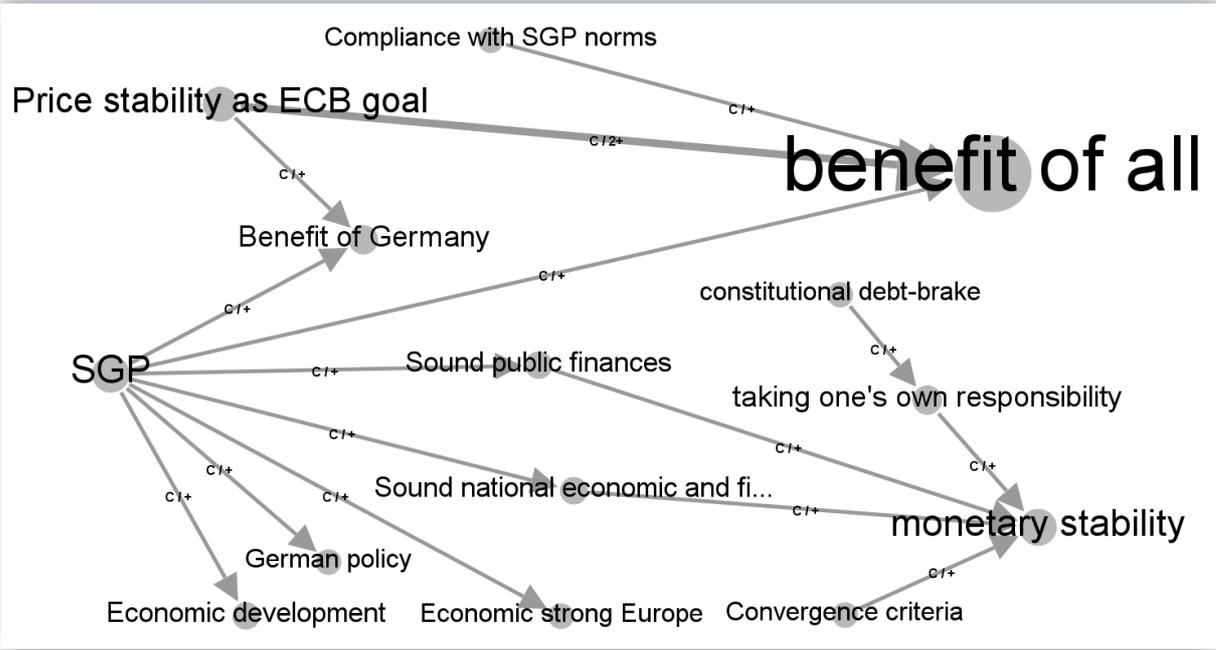

Figure 1: Excerpt from a pre-crisis cognitive map of Chancellor Angela Merkel

Sourcing the Data

The data that is needed to construct cognitive maps can be sourced in two ways. The first way is by direct elicitation, which is often (but not by definition) done in a more deductive fashion. With direct elicitation, respondents draw maps themselves using their chosen or a set of predetermined concepts. The second way of sourcing data is by indirect elicitation and requires the researcher to derive maps from actors' speech-acts, interviews or writings. This may again be done deductively using a pre-determined set of concepts, or inductively.

Direct Elicitation

When choosing for direct elicitation of a cognitive map, two different procedures are available: the pairwise comparison and freehand drawing approach. The

pairwise comparison presents actors' (leaders or citizens) with a set of concepts and asks them to evaluate whether pairs of concepts are causally or normatively related or not. Participants to the research will have to review all possible combinations of the concepts in the set (Hodgkinson et al 2004; Clarkson & Hodgkinson 2005; Markiczy & Goldberg 1995). Previous studies suggest that this method results in very comprehensive maps, but the method is also more time-consuming and labour intensive and is seen to be tedious by participants. In addition, Hodgkinson et all (2004) have found that participants in their study rate representativeness of the resulting maps as much lower than of those resulting from the freehand approach.

For this reason, this guideline recommends using the freehand approach (cf. Van Esch et al 2014). With the freehand approach, respondents start by choosing concepts they deem most relevant for the topic at hand (from a predetermined list, or inductively) and graphically draw arrows between these concepts to represent their ideas on how these concepts relate. Participants draw a red arrow to represent a negative causal or utility relationship and a green arrow to represent a positive relationship. This results in a map that reflects the ideas of the respondents directly. In order to allow the participant to draw such maps, a new web-based application was developed: DART.[2] This software is unique in that it allows citizens to draw their personal map freehand through a user-friendly digital interface. In addition, the application automatically creates a digital database of cognitive maps. The data from these maps can be linked to the outcomes of survey questions about political and demographic characteristics of respondents, and allows for the aggregation, processing and analysis of data from large groups of citizens. Finally, DART exports the survey and CM data in the formats required by other analytical (CM) software packages like SPSS, Worldview and Gephi (Bastian et al 2009; Young 1996).

A note of caution is necessary when using direct elicitation of cognitive maps. In principle, concepts can be positive (for instance prosperity), negative (recession), or neutral (employment) in their meaning. Studies on survey research show that double negative language constructions are more difficult to comprehend and therefore prone to mistakes (De Vaus 2014: 97). This jeopardise the validity of the study. In the case of CCM, double negative language constructions can be equated with combining a negative concept with a negative arrow. For instance, the negative relation 'the actions of the banks ➡ recession' formally means that the actions of the banks reduced the recession, thus improving the economy. However, previous research shows that many respondents draw this relationship to indicate that the actions of the banks 'were bad for' the recession, thus

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[2] DART was developed by Femke van Esch in collaboration with Btdt.btt and will be made freely available for all participants of TRANSCRISIS for the duration of the project.

worsening the recession. In direct elicitation, negative concept should therefore be avoided (Van Esch et al 2014).

Indirect Elicitation

The second way of sourcing data for cognitive maps is through indirect elicitation. This method is especially useful when respondents are not available for direct elicitation, of which high political leaders are an important example. However, indirect elicitation may also be used to construct a cognitive map on the basis of party manifesto's, columns and other text-based sources of ideas thereby representing the public debate. Using the extensive existing coding schemes and/or training possibilities, a researcher derives the causal and utility relationships manually from a speech-act or text (Axelrod 1976; Young & Schafer 1998) and transfers them into a graph.

Indirect elicitation of cognitive maps requires the researcher to make decisions about the meaning of statements during the coding process and to conduct some a posteriori standardisation of peoples wording to make comparison of maps possible. This makes indirect elicitation quite labour intensive and requires coders to have extensive knowledge of the topic of the speech-act, and the context and background of the actor under study. In addition, though the procedure is complicated and labour intensive, scholars adhering to positivist philosophy of science may choose to double-code and establish whether the level of inter-coder reliability is sufficient (Axelrod 1976; Hodgkinson et al 2004: 4).

Finally, when using any means of self-reporting as a source, be it in the form of speech-acts, interviews, texts, survey-question or direct elicitation, there are questions about the validity and reliability of the data and possible strategic intentions of the self-reporting actors. Moreover, all of these possible sources for cognitive maps have their own advantages and drawbacks. In the case of political leaders, speeches are usually readily available but may suffer from speech writers effect. Interviews may contain more spontaneous speech but may suffer from an interviewers bias. This raises the question as to what the nature of the ideas reflected in a cognitive map is. Does a cognitive map reveal the genuine beliefs of actors, or their strategic positioning or that of their speech writers? The answer to this question depends on the research design, methodological choices and the precise aim of the study. As the Transcrisis project aims to reveal the policy ideas, preferences and discourses that were relevant for how crisis management is enacted, the aim of using cognitive maps in this study is not to reveal actors' inner thoughts. The actors selected for this study are of interest because of their public role in EU crisis management.

What CCM can Teach us

To date, the study of ideas and discourses has relied predominantly on a combination of qualitative methods like interviewing, process-tracing, qualitative or narrative analysis of texts and speech-acts and the occasional word count technique (Blyth 2013; Crespy & Schmidt 2014; Hall 1993; Parsons 2002; Schran-Sternberg 2012). While this has taught us many important lessons about the nature of ideas and discourses and their role in politics, these methods were never specifically designed for this purpose. As a consequence, these techniques struggle to capture the different characteristics of, and changes in, leaders' ideas and public discourses that may help to understand whether and why the management of transboundary crises was effective and/or legitimate. In addition, to date citizens' preferences are measured predominantly through survey-research. However, the questions presented to citizens in surveys are often one-dimensional with pre-defined answers and do not allow for nuanced or ambivalent response or holistic analysis (Schaffer 2010). As such, they give people little room to tell their own stories. Qualitative inquiries of citizens' attitudes do tap into the substantive reasoning behind people's perceptions but are labour-intensive and unable to cover large representative groups of people. Cognitive Mapping may offer an complementary technique that helps overcome the drawbacks of these traditional methods.

CCM has been used to uncover; 1) actors' or institutions' ideas and paradigms and the change therein (Bonham et al 1979; Hart 1976; Princen & Van Esch, forthcoming; Van Esch 2007; 2012; 2014; Young 1994); 2) structural characteristics of belief systems and worldviews (Hart 1976; Levi & Tetlock 1980; Young 1994); 3) predict and explain political behaviour and the position of actors in, and outcome of negotiations and coalition-formation (Bonham et al 1979; Hart 1976; 1977; Shapiro & Bonham 1973; Young 1994; Septer et al. 2012). The diverse array of questions have been tackled using both the quantitative and qualitative analysis of cognitive maps. Below, an overview is provided of the most important forms of analysis provided by CCM and the kinds of results they deliver. To stress the relevance of CCM for the Transcrisis project, several examples are provided using data from previous studies (Van Esch & Joosen 2015; Van Esch 2014; 2015).

Map and Narrative

The first outcome CCM produces is the cognitive map itself. This map displays the ideas of an actor in a systematic, graphical manner. In its graphic form, a cognitive map may be used to reconstruct the narrative or argumentation of the actor in a systematic but holistic way. This is done by studying the paths in a map: the sequences of any number of concepts and relations. Any path leading out of a concept is called a consequent path, any path feeding into a concept is an antecedent path to that

concept. In addition to showing what concepts are related in the mind of the actor and in what way, analysing the signs of the relationships reveals whether a certain idea is valued positively, negatively or ambiguously. To do this all consequent paths leading from a concept to a 'utility concept' are studied. As utility concepts refer to a general and abstract sense of well-being or the lack thereof, they hold a natural positive or negative value. By analysing the sign of the consequent path between a concept and a utility concept, it may be established whether an idea is valued positively, negatively or ambiguously within a belief system, paradigm or discourse (Hart 1977; Van Esch 2007; 2014).

In Box 1, an example of a narrative analysis is provided using a cognitive map of Geert Wilders, leader of the Dutch Eurosceptic Party for Freedom and Liberty (PVV).

The narrative that is described here is very typical of the European views of Wilders and his party. It may be of great value to describe and visualise his map in a systematic and holistic way so as to analyse the rationale behind his position and better understand his political behaviour, the relation with coalition partners and the opposition in Dutch and European politics, and the connection between Wilders and his voters. The latter can be facilitated by constructing a cognitive map of PVV voters using direct elicitation and comparing it to the map of Wilders.
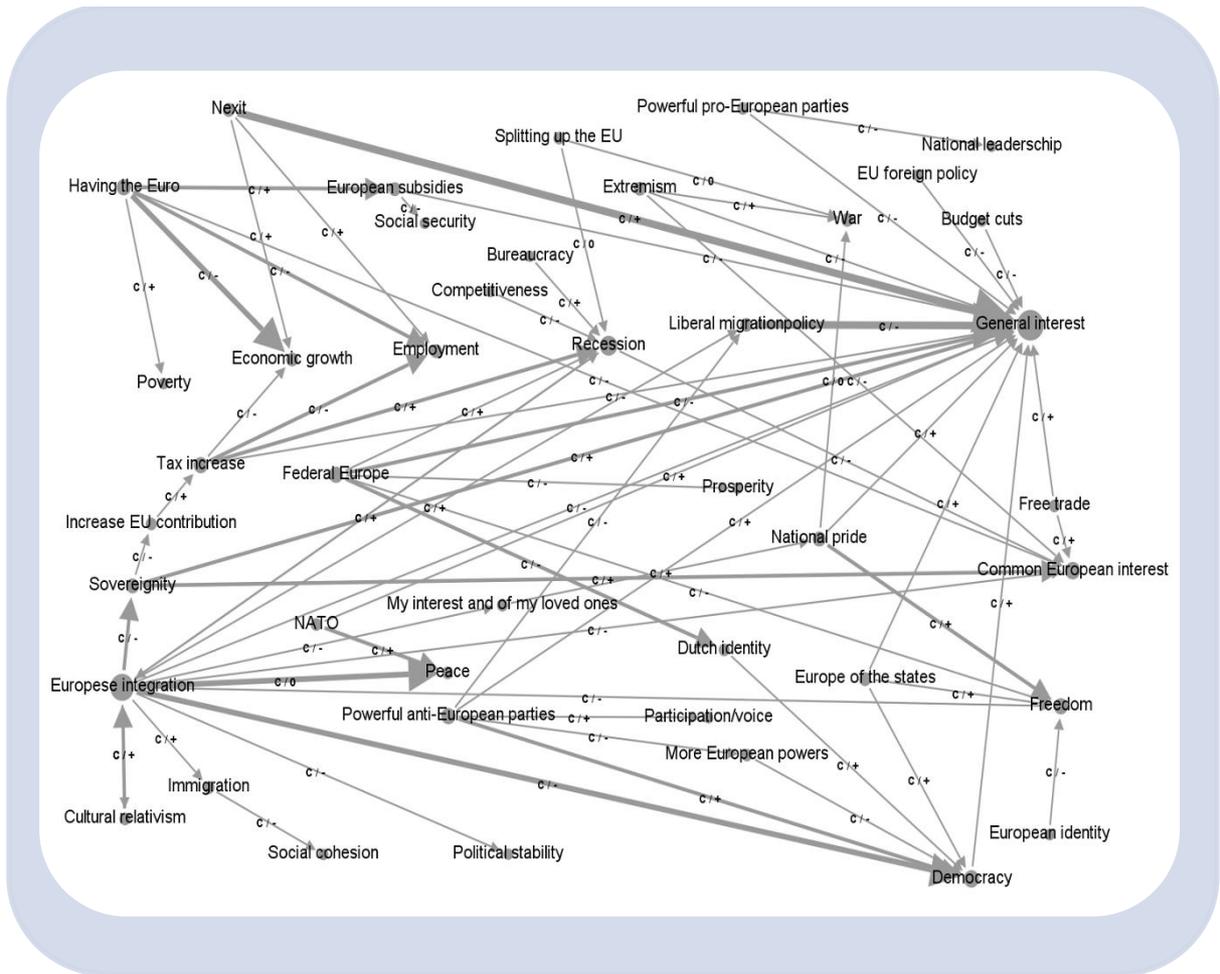
Box 1: Narrative Analysis of Cognitive map of Geert Wilders

The cognitive map shows that Wilders speaks about Europe in very specific and mainly causal terms. The relations that stand out most are those stating that European integration reduces democracy and that the Dutch exit is in the general interest. Wilders uses many arguments to support his claims which provides vital information about his views. For instance, he pleads against the Euro because, in his eyes, it leads to the instatement of European subsidies, which do not serve the general interest. He further supports his stance on the Euro by stating that the Euro leads to more poverty and unemployment and limits economic growth. His general anti-European stance is based on the view that the EU is to blame for the recession and leads to a loss in sovereignty, which in turn forces The Netherlands to contribute more to the European budget. This requires a further tax increase which, in turn, fosters the recession. Finally, Wilders is a staunch opponent of further European federalization, which he feels is not in the general interest. He also connects European federalisation to a loss in Dutch identity, which he preceives to be a threat to the positive goal of preserving democracy.

Saliency and Centrality

The second basis for the analysis of the ideas represented in a cognitive map is the saliency (S) of the concepts and relations in the map. In cognitive mapping, the relative strength of policy beliefs (concepts or relations) is determined by establishing the frequency with which they are mentioned. The more salient the concept or relation, the larger they appear in the map (see figure 1). If the saliency of a relation is more than 1, this may also be noted in the arrow in the cognitive map. The saliency of a concept is calculated by adding up all of the relations by which the concept is connected to others. The saliency (weight) of the relation is included in the calculation. The saliency of the concept 'benefit of all' in figure 1 is 4 (two relations with S=1 and one relation with S=2), the saliency of concept sound public finances is 2 (2 relations with S=1).

Three other measures that are associated with the importance of ideas as well as the position of an concept in a map are: in-degree, out-degree and centrality (C). These only apply to the concepts in a map. In-degree refers to the number of arrows feeding into a particular concept, out-degree to the number of arrows feeding out of a concept. Centrality is the sum of the in-degree and out-degree of a concept and thus represents all arrows that connect an concept to the rest of the map, not counting their weight. The measures of centrality, in- and out-degree are mostly used as a basis for other measures (see below). Box 2 contains a first illustration of what the measure of saliency may contribute to the analysis of a cognitive map by listing the ten most salient concepts in Wilders' map.

Evaluation

A third way to analyse cognitive maps is to look at how certain idea are evaluated. This is done by using the negative and positive relations that connect a concept to other concepts in a map. A concept X that is linked by only positive or an even amount of negative consequent paths to a positive concept Y, is perceived to be positively contributing to a positive result and can therefore be regarded as positive itself. A concept X that is linked to Y through a path containing a uneven amount of negative relations is seen to be negatively associated with Y and therefore negative. A concept X that is linked to Y by any number of non-existing (0) relations, cannot be evaluated and is ambiguous. By adding up all positive, negative and ambiguous evaluations of a concept a total evaluation score is established that indicates the overall desirability of the concept in the eyes of the actor. Box 2, also shows the total evaluation scores of the ten most salient ideas (concepts) in Wilders' map.

Relation		Relative Weight		Rank		Evaluation	
Cause	Effect	Wilders	PVV voters	Wilders	PVV voters	Wilders	PVV voters
European integration	Democracy	3,13	0,46	2	4	3-	1-
Having the Euro	European subsidies	2,08	0,46	3	4	2+	1+
European integration	Sovereignty	2,08	0,46	3	4	2-	1-
Having the Euro	Poverty	1,04	1,83	4	1	1+	1+/2-
European integration	Political stability	1,04	0,91	4	3	1-	2-

Box 2: Comparing Wilders to his voters

Cognitive mapping provides a possibility to compare certain groups, individuals and discourses with each other. Above, an example is given of a comparison of a leader and his voters: The Dutch politician Wilders and his constituents. This is done by displaying the most salient relations in Wilders' map and whether his voters value these relations in a similar way. By comparing differences in saliency a considerable congruence between Wilders ideas and those of his voters is revealed with regard to the ranking of concepts in terms of saliency

There are two notable exceptions to this pattern. One is that Wilders speaks more frequently about the negative effect of European integration on democracy than the people who vote for him. An even more striking difference is that Wilders argues that having the Euro leads to more poverty while his constituency feels having the Euro leads to less poverty. On top of this, the relation between European integration and democracy is more for the voters than Wilders.

However, this relationship is at the same time an example of the difficulty of working with negative concepts outlined above. For using negative concepts may lead to confusion when respondents are drawing maps. The relation 'Having the Euro ➡ poverty' may, for example, have been interpreted by the respondents as having the Euro has a negative effect on poverty and as such lead to more poverty, rather than the Euro reduces poverty. As argued before, negative concepts are thus best avoided when using indirect elicitation of CMs.

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Ideologies and Paradigms

The three above mentioned modes of analysis may be used in combination to establish the overall ideological or paradigmatic tendency of an actor's worldview or public discourse. This may be of great importance in the analysis of crisis decision making as is illustrated by the fierce debate on the nature and consequences of the so-called Keynesian-Ordoliberal divide during the Euro crisis (Blyth 2013; Dullien & Guerot 2012; Howarth & Rommerskirchen 2013; Princen and Van Esch forthcoming; Van Esch 2014). Firstly, the particular ideologies or paradigms deemed relevant for the crisis response must be clearly specified and operationalised. Subsequently, all concepts in a cognitive map (or multiple cognitive maps) representing the ideas of leaders, citizens or public discourses should be categorised as indicative of these ideologies or paradigms (or not). Again, scholars may want to use double coding and calculate the intercoder reliability to ensure the reliability of this categorisation. Subsequently, the saliency of all positively evaluated concepts referring to a certain ideology or paradigm can be summed up into a score indicating the level of adherence to that ideology or paradigm (see box 3a; Van Esch 2014). The same procedure may also be applied to other characteristics of the concepts in a cognitive map like whether they refer, for instance, to monetary or fiscal policy. Moreover, these may be combined to intricate analysis of the ideological nature of such monetary or fiscal ideas (see box 3b; Van Esch 2015).

In combination with a narrative analysis aimed at uncovering specific argumentative strands typical for a particular ideology or paradigm this makes for a very powerful analytical tool (see Van Esch 2012; 2014). Box 3 provides an example of how this type of analysis provides new insights in how the advent of the Euro crisis affected the worldviews of the German Chancellor Angela Merkel and French President Nicolas Sarkozy (Van Esch 2014; 2015).

GO

Finally, building on the work of Hart (1976; 1977) and Bougon et al (1977), the measure of goal-orientation (GO) was developed (Van Esch 2014). This measure is based on the premise that the higher the in-degree of a concept, the more it is perceived as a goal or effect and higher the out-degree, the more it is perceived as an instrument or cause. For instance, in figure 1, the concept 'peace' has only incoming relations, no outgoing relations and is therefore considered a typical goal or effect. Conversely, 'having the Euro' has only out-going relations and is therefore a typical cause or instrument. The exact formula for calculating GO is (Indegree-Outdegree)∕Centrality, and the measure has a range from -1 to 1 (cf. Bougon et al. 1977; Hart 1977).

■ Keynesian   ■ Ordoliberal   ◆ Median

19,44   13,43   9,02   12,02

-2,31   -7,21   -25,56   -8,14

Merkel Pre-Crisis   Merkel Crisis   Sarkozy Pre-Crisis   Sarkozy Crisis

Mon-Keyn
14,00
12,00
10,00
8,00
6,00
4,00
2,00
0,00

sc-Ordo   Mon-Or

Fisc-Keyn

■ Sarkozy Pre-crisis   ■ Sarkozy Crisis
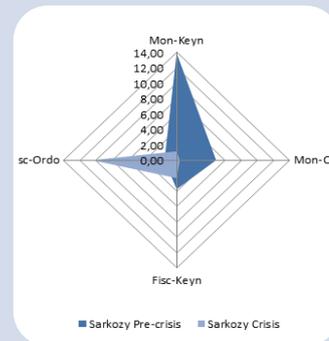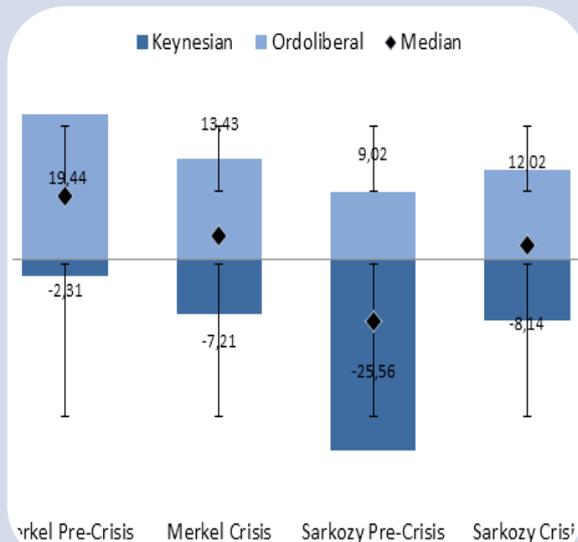
Box 3a: The Keynesian and Ordoliberal Nature of the Worldview of Merkel and Sarkozy

Prior to the crisis, Merkel had a strong Ordoliberal outlook on economic and monetary policy-making. The overall saliency of Ordoliberal concepts (19%) was eight times as high as that of Keynesian concepts. Moreover, on average the Ordoliberal beliefs were almost twice as salient as Keynesian beliefs. In contrast, the pre-crisis cognitive map of President Sarkozy was pre-dominantly Keynesian in character. This is especially apparent at the conceptual level, for both the aggregated and average concept saliency of his Keynesian beliefs were 2,8 times as high as that of his Ordoliberal ideas. After the onset of the crisis, Merkel remains Ordoliberal in her thinking, but less so. This is due both to the expansion of the number of Keynesian ideas, as well as an increase in the average saliency of which now exceed that of Ordoliberal concepts. On the whole, however, the aggregate saliency of Ordoliberal beliefs remains twice that of Keynesian ideas. Sarkozy experienced a significant belief change with the onset of the Euro-crisis. This was predominantly due to a significant decrease of the number of Keynesian ideas and their saliency (see table 1). As a result, Ordoliberal ideas become dominant. Since the average saliency of Keynesian and Ordoliberal is now similar, it must be concluded that after the outbreak of the Euro-crisis, Sarkozy experienced a reversal of ideas from Keynesian to Ordoliberal (Van Esch 2014).

Box 3b: The Relation between Sarkozy's Monetary and Fiscal ideas and the Keynesian and Ordoliberal Paradigm

On closer inspection, the crisis-induced changes in the worldview of the French President shown in box 3a turn out to be more ambiguous. More indepth analysis shows that Sarkozy adopts more fiscal ideas and shows himself to be a mild fiscal ordoliberal. In monetary terms, however, his ideas remain in stark conflict with Ordoliberal thinking. The onset of the Euro-crisis thus induces a clear paradigmatic reversal to Ordoliberalism in the President's fiscal but not his monetary ideas (Van Esch 2015).

Conclusions

Transcrisis aims to develop a solid understanding of the role of leaders in managing transboundary crises and the requirements for ensuring an effective and legitimate crisis response. Leaders' policy ideas, peoples' preferences and public discourses play an important role in this. To establish the precise nature and effects of these 'soft' but influential factors in crisis management the project will make use of a method of Comparative Cognitive Mapping (CCM). Through its various modes of analysis, CCM enables a comparison between actors' ideas and the evolution of ideas and discourses over time that can be usefully combined with techniques that provide insight in the material and institutional factors involved in making crisis management effective and legitimate. This guideline has provided an overview of the CCM technique as well as some basic instructions of how to apply the method. A more detailed coding manual will be developed as part of Work Package three of the project.

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